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ABSTRACT

This study hypothesized that items in the one-question-per-passage format would be less easily answered when administered without their associated contexts than conventional reading comprehension items. A total of 256 seventh and eighth grade students were administered both Forms 3A and 3B of the Sequential Tests of Educational Progress (STEP 11). Context present and context absent scores were obtained for 15 items on the Hanna-Oaster Approach forms. The statistics for the two experimental forms and six tests of Tuinman are presented. Overall, this comparison supports the hypothesis and reflects positively upon the one-question-per-passage items as measures of comprehension. Ostensibly this format is an economical as well as effective means of dealing with the threat of item interrelatedness. The conclusion that this format is a useful means of constructing context dependent multiple-choice tests of reading comprehension must be evaluated in view of the influence that exclusive use of this format would have on content validity. If such an influence is neutral or positive, then the format may be a practical means of dealing with the threat of item interrelatedness to context dependence. If the format negatively influences content validity, then its use would merely substitute one source of invalidity for another. (Author/PN)

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CONTEXT DEPENDENCE OF ONE-QUESTION-PER-PASSAGE MEASURES OF READING COMPREHENSION

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RUNNING HEAD: CONTEXT DEPENDENCE OF ONE-QUESTION-PER-PASSAGE MEASURES OF READING ITEMS

ABSTRACT

The suggestion that interrelatedness of items, one threat to context dependence, can be avoided by employing a one-question-per-passage format was studied with items from a standardized reading test administered to 256 seventh and eigth grade students. Items under study were more context dependent and less context independent, on the average, than items from several major tests. Validity of the item type is discussed.

Context Dependence of

One-Question-per-Passage Measures of Reading Comprehension

Reading research has lead to elaboration of the practical (Bligh, 1981) and theoretical (Oaster, 1981) importance of the connection between reading passages (context) and associated multiple-choice measures of comprehension. Oaster (1981) has discussed the importance of quantifying the connection (context dependence) between passages or context and associated context dependent test items which purport to quantify comprehension of context. Conditions which allow testees to produce above-chance scores without reading accompanying passages also have been discussed (Hanna & Oaster, 1978-1979; Preston, 1964; Pyrczak, 1972; Weaver & Bickley, 1967). These above-chance scores indicate that test items are less than context dependent which calls into question the construct validity of the items for measuring reading comprehension. Potentially invalidating conditions associated with context independent items are (1) testees' general knowledge concerning topics on which passages are based, (2) flaws in individual items, and (3) item interrelatedness that results in items clueing each other. The first two of these conditions can be minimized by competent item writing and editing (Duffelmeyer, 1980). The third condition which may allow examinees to answer items without reading corresponding passages is more difficult to circumvent. Pyrczak (1972) suggested that interitem clueing could be obviated by basing only one item on a given passage. In the present study, it was hypothesized that items in the one-question-per-passage format would be less easily answered when

administered without their associated contexts than conventional reading comprehension items.

Method

Subjects

A total of 256 seventh and eighth grade students from two midwestern school districts were administered Forms 3A and 3B of the STEP 11. Approximately half the students took Form 3A context present while the other half took Form 3B context present (CP). After a short rest those students who had taken Form 3A took 3B and those who had first taken Form 3B took Form 3A context absent (CA).

Materials

Half of the Part 1 items in both Form A and Form B of the Level 3 Sequential Tests of Educational Progress, Series II, Step II Reading Test are in a one-question-per-passage format. These items appear to be difficult to answer under the CA condition and therefore provide good experimental measures to test Pyrczak's suggestion.

Results

The relative merits of various quantitative measures of context effects have been discussed by others who appear to favor the formulas referred to as the Hanna-Oaster Approach (Entin & Klare, 1980). All calculations in the present study are according to formulas designed by Hanna and Oaster (1978-1979).

CP and CA scores were obtained for the 15 items under study on each form. Because all items used in the present study were on the four-option multiple-choice variety the expected chance score for each

item was .25. The CP, CA, X/ND, CII and CDI statistics for the two experimental forms and six other tests (Tuinman 1973-1974) are presented in Table 2. For measures of reading comprehension, other things being equal, low CII and high CDI indices provide optimal circumstances. Current data and those due to Tuinman (1973-1974) were compared.

For each experimental form of the STEP II, mean CII indices were lower than for any of the six tests for which data are presented in Table 2. In addition for Form 3A, the mean CDI index was higher than for the other six tests in Table 2. The mean CDI index for Form 3b exceeded those of three of Tuinman's tests. Overall, this comparison of CII and CDI values not only supports the hypothesis of this study, but also reflects positively upon the one-question-per-passage items as measures of comprehension.

Tables 1 and 2 about here

Discussion

The one question-per-passage items in this study were associated with lower CII scores on sex other major standardized tests of reading comprehension. This format was also associated with higher CDI indices than those same standardized tests in 9 of 12 instances. Ostensibly the one-question-per-passage format is an economical as well as an effective means of dealing with the threat of item interrelatedness. This economy can be seen in part by considering the compactness of the item type.

Part I of Form 3A and Form 3B of the STEP II both devote approximately 2 1/2 pages and 15 minutes to the acquisition of 30 testee responses. Part II of these forms (traditional passage/item format), on the other hand, devotes approximately 10 pages and 30 minutes of 30 testee responses. The reduction of testee time by 50% seems to be a virtually extraordinary savings.

The conclusion that a one-question-per-passage format is a useful means of constructing context dependent multiple-choice tests of reading comprehension must be evaluated in view of the influence that exclusive use of this format would have on on content validity. If such an influence is neutral or positive, then the format may be a practical means of dealing with the threat of item interrelatedness to context dependence. However, if the one-question-per-passage format negatively influences content validity, then its use would merely substitute one source of invalidity for another. Future studies of context dependence and the one-question-per-passage format should address these issues.

References

Bligh, H. F. (1981, April). How important is passage dependence in reading comprehension: Some practical considerations. Paper presented at the annual convention of the International Reading Association. New Orleans, LA.

California Achievement Tests, Reading Level 3, Form A.(1970). Ernest W. Tiegs and Willis W. Clark. Monterey, California: CTB/McGraw Hill.

Duffelmeyer, F.A. (1980). The passage independence of factual and inferential questions. Journal of Reading, 24, 131-134.

Entin, E. B. , & Klare, G. R. (1980). Components of answers to multiple-choice questions on a published reading comprehension test: An application of the Hanna-Oaster Approach. Reading Research Quarterly, 15, 228-236.

Farr, R. & Smith, C. B. (1970). The effects of test item validity on total test reliability and validity. In G. Schick and M. M. May (Eds.) Reading: Process and Pedagogy. Nineteenth Yearbook of the National Reading Conference, 1, Milwaukee, WS, 122-134.

Hanna, G. S. & Oaster, T. R. (1978-1979). Toward a unified theory of context dependence. Reading Research Quarterly, 14, 226-243.

Iowa Test of Basic Skills, Reading Multilevel Edition, Form 5. (1970). A. N. Hieronymus & E. F. Lindquist. Boston: Houghton Mifflin.

Metropolitan Achievement Test, Reading, Elementary Battery, Form F;

Intermediate Battery, Form F. (1970). Walter Durost, Harold H. Bixler, J. Wayne Wrightstone, George A. Prescott, and Irving H. Balow. New York: Harcourt, Brace, Jovanovich.

Nelson Reading Test, Form A. (1962). M. J. Nelson. Boston: Houghton Mifflin.

Oaster, T. R. F. (1981, April). Context oriented skills: Beyond passage dependent assessment of reading comprehension. Paper presented at the annual convention of the International Reading Association. New Orleans, LA.

Preston, T. C. (1964). Ability of students to identify correct responses before reading. Journal of Educational Research, 58, 181-183.

Pyrczak, F. Jr. (1972). Objective evaluation of the quality of multiple-choice items designed to measure comprehension of reading passages. Reading Research Quarterly, 8, 62-72.

Sequential Tests of Educational Progress, Reading, Form 3A. (1957). Princeton: Educational Testing Service.

Sequential Tests of Educational Progress, Series II, Reading Test, Form 3A and Form 3B. Princeton: Educational Testing Service.

Science Research Associates Achievement Series, Reading, Form E, Blue Level. (1971). Robert A. Naslund, Louis P. Thorpe, and D. Welty LeFever. Chicago: Science Research Associates.

Tuinman, J. J. (1973-1974). Determining the passage dependency of comprehension questions in five major tests. Teaching Research Quarterly, 9, 206-223.

Weaver, W. & Brickley A. C. (1967). Sources of information for responses to reading test items. Proceedings of the 75th Annual Convention of the American Psychological Association, 7, 293-294.

TABLE 1

STEP II Individual Item Statistics

Item#	CA	CP	X/ND	CII	CDI
FORM 3A					
1	.20	.93	.07	-.05	.73
2	.39	.88	.12	.14	.49
5	.42	.87	.13	.17	.45
7	.27	.78	.22	.02	.51
9	.30	.64	.36	.05	.34
11	.18	.77	.23	-.07	.59
15	.38	.59	.41	.13	.21
16	.31	.41	.59	.06	.10
17	.25	.59	.41	.00	.34
19	.18	.43	.57	-.07	.25
21	.22	.64	.36	-.03	.42
25	.18	.34	.66	-.07	.16
28	.18	.17	.83	-.07	-.01
29	.22	.20	.80	-.03	-.02
30	.14	.24	.76	-.11	.10
FORM 3B					
1	.83	.75	.25	.58	-.08
4	.33	.85	.15	.08	.52
5	.61	.70	.30	.36	.09
10	.29	.62	.38	.04	.33
11	.42	.82	.18	.17	.40
12	.21	.52	.48	-.04	.31
13	.33	.64	.36	.08	.31
14	.60	.81	.19	.35	.21
20	.14	.46	.54	-.11	.32
22	.17	.34	.66	-.08	.17
24	.34	.49	.51	.09	.15
25	.22	.33	.67	-.03	.11
26	.27	.57	.43	.02	.03
28	.14	.12	.88	-.11	-.02
29	.18	.30	.70	-.07	.12

TABLE 2

Mean Item Statistics for Experimental One-Question-Per-Passage Items, and Tuinman's Reading Test.

Test	$\overline{CA}$	$\overline{CA}$	$\overline{X}$/ND	$\overline{CII}$	$\overline{CDI}$
Reading Level Experimental Items					
3 STEP, Series II:					
Part I Form A (15 items)	.25	.57	.43	.00	.32
Part I Form B (15 items)	.34	.55	.45	.09	.21
Two Form Average	.29	.56	.44	.05	.27
Tuinman's (1973-1974) Tests					
Metropolitan Achievement Tests, Reading-Elementary Battery, Form F (45 items)	.49	.66	.34	.24	.17
Metropolitan Achievement Tests, Reading-Intermediate Battery, Form F (45 items)	.45	.64	.36	.20	.19
Iowa Tests of Basic Skills, Reading, Multilevel, Form 5 (60 items)	.46	.64	.36	.21	.18
California Achievement Tests, Level 3 Form A (42 items)	.34	.63	.37	.10*	.29
SRA-Achievement Series, Reading, Form E, Blue Level (60 items)	.37	.62	.38	.12	.25
Nelson Reading Test, Form A (75 items)	.39	.61	.39	.14	.22

*$\overline{X}_C$ = .24

Note: Mean CII and CDI values calculated from data were a reanalysis of data originally presented by Tuiman (1973-1974).